REMARKS

With this response, Claims 32-35 are pending. Claims 32 and 35 have been amended without prejudice or disclaimer. Support for the foregoing amendment can be found throughout the Specification and the Claims as originally filed, for example, in the Substitute Specification at page 3, lines 17-26; page 4, line 15 - page 5, line 13; and Figures 1-6.

In order to facilitate prosecution, Applicants bring the Examiner's attention to Co-Pending U.S. Application Numbers: 10/785,114; 10/979,303; 10/929,958; and 10/979,654. These applications are also assigned to the same entity and are prosecuted by the undersigned. Pending claims in these application can be provided to the Office if requested. Nothing in this submission should be taken to suggest that similar subject matter is or is not set forward in those claims. Moreover, as the Examiner will appreciate, Applicants may amend the claims in the future.

I. Rejection under 35 U.S.C. § 112, Second Paragraph

The Office asserts that Claims 32 and 35[1] are rejected under 35 U.S.C. § 112, second paragraph, for allegedly failing to particularly point out and distinctly claim subject matter which Applicant regards as the invention. Office Action at page 3. In rejecting these claims, the Office alleges that the term "OCIF protein" is indefinite. *Id.* Further, the Office asserts that "[t]here is no structure associated with this term and there is no art accepted meaning of this term at the time the instant invention was filed." *Id.*

Applicants respectfully disagree with the Office's indefiniteness rejections under 35 U.S.C. § 112, second paragraph. However, in order to facilitate prosecution, Applicants have amended Claims 32 and 35 without prejudice or disclaimer. As such, Applicants respectfully assert that the claim rejections are rendered moot.

Applicants respectfully submit that the Office's 35 U.S.C. § 112, second paragraph, indefiniteness rejection lacks any legal basis whatsoever. Applicants submit that the scope of the subject matter claimed is clear. Breadth of a claim is not to be equated with indefiniteness. *In re Miller*, 441 F.2d 689 (CCPA 1971). If the scope of the subject matter embraced by the claims is

[1] Claims 32 and 35 are both independent claims.

clear, and if applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. § 112, second paragraph. See MPEP § 2173.04.

Moreover, MPEP § 2173.02 states that the Examiner "should allow claims which define the patentable subject matter with a reasonable degree of particularity and distinctness. Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire." In making this determination, MPEP § 2173.02 goes on to clarify that definiteness of claim language must be analyzed, not in a vacuum, but in light of the disclosure, prior art, and ordinary skill in the pertinent art. Given the above standard, Applicants respectfully submit that the claims are definite.

Applicants disagree with the Office's assertion that the term "OCIF" is indefinite because it does not "define the specific structure of the amino acid sequence." Office Action at page 3. Applicants respectfully submit that there is no requirement to define the specific structure of the amino acid sequence of OCIF in order to satisfy 35 U.S.C. § 112, second paragraph. As claimed in independent Claims 32 and 35, the OCIF protein is characterized by a molecular weight of 60 kD under reducing conditions and molecular weights of 60 kD and 120 kD under non-reducing conditions. Moreover, Applicants have provided a detailed description of OCIF purification and have even disclosed the elution pattern and elution peaks of OCIF protein from a reverse-phase column. Substitute Specification, for example, at page 3, lines 17-26. at page 4, line 15 - page 5, line 13; and Figures 1-6. This alone is enough to satisfy 35 U.S.C. § 112, second paragraph. Applicants have also characterized the functional, chemical, and physical properties of the OCIF protein. Substitute Specification, for example, at page 3, lines 18-25; page 10, lines 18-20; Figures 1-6; Examples 3-5, 13, and 15-17; and Tables 5-9. For at least the above reasons, Applicants submit that the term "OCIF" is sufficiently definite to satisfy 35 U.S.C. § 112, second paragraph, and the rejections should be withdrawn.

II. Rejection under 35 U.S.C. § 112, First Paragraph, Written Description

Claims 32 and 35 stand rejected under 35 U.S.C. §112, first paragraph, as allegedly containing subject matter which was not described in the Specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the

application was filed, had possession of the claimed invention. Office Action at pages 3-4. In support of this rejection, the Office alleges that Claims 32 and 35 encompass "polypeptide variants of SEQ ID NO:5 without structural limitations because of the recitation of the polypeptide by name only." *Id.* at page 3. The Office goes on to assert that "the essential feature of the invention is not clear because the polypeptide SEQ ID NO:5 structure is not provided, and one of skill in the art can not envision the full genus of the molecules of the claimed polypeptide molecules." *Id.* at pages 3-4.

Applicants respectfully disagree with the Office's written description rejection under 35 U.S.C. § 112, first paragraph. However, in order to facilitate prosecution, Applicants have amended Claims 32 and 35 without prejudice or disclaimer. As such, Applicants respectfully assert that the claim rejections are rendered moot.

The standard for determining whether a claim drawn to a genus meets the written description requirement is clear. "The written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice . . . , reduction to drawings . . . , or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus." *See Regents of the University of California v. Eli Lilly,* 119 F.3d at 1568, 43 USPQ2d at 1406; M.P.E.P § 2163(II)(3)(a)(ii) (emphasis added). A "representative number of species" means that the species which are adequately described are representative of the entire genus. Description of a representative number of species does not require the description to be of such specificity that it would provide individual support for each species that the genus embraces. *Id.* Applicants have met this burden.

Applicants fail to understand why the Office has rejected Claims 32 and 35 under 35 U.S.C. §112, first paragraph. The Specification is replete with functional and physical data describing the OCIF protein. Substitute Specification, for example, at page 3, lines 18-25; page 10, lines 18-20; Figures 1-6; Examples 3-5, 13, and 15-17; and Tables 5-9, 14. However, in rejecting the claims, the Office does not address or even discuss the data present in the Specification. In addition to purifying and isolating the OCIF protein, Applicants have

characterized numerous functional, chemical, and physical properties of the OCIF protein, such as molecular weight, biological activity, thermostability, the *in vivo* effect of OCIF on increasing the mechanical strength of bones in rats, and the use of OCIF in improving decreased bone mass and increasing bone density. *Id.*

Applicants have also provided a detailed description of OCIF purification and have even provided the elution pattern and elution peaks of the OCIF protein from a reverse-phase column. Substitute Specification, for example, at page 4, line 15 - page 5, line 13; and Figures 1-6. At a minimum, this is evidence that Applicants were in possession of the claimed invention at the time of filing. Moreover, Applicants have physically characterized the OCIF protein as having a molecular weight of 60 kD under reducing conditions and molecular weights of 60 kD and 120 kD under non-reducing conditions. Substitute Specification, for example, at page 3, lines 17-26. Again, this disclosure is enough to satisfy the written description requirement under 35 U.S.C. §112, first paragraph.

Applicants respectfully submit that one skilled in the art would readily appreciate that Applicants, at the time of the filing of the present application, were in possession of the claimed invention and, therefore, have met the written description requirement. As such, it is submitted that the claims comply with 35 U.S.C. §112, first paragraph, and withdrawal of this rejection is respectfully requested.

III. Rejection under 35 U.S.C. § 112, First Paragraph, Scope of Enablement

Claims 32 and 35 stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter which was not described in the Specification in such a way so as to enable those skilled in the art to make and/or use the invention commensurate in scope with the claims. Office Action at page 4. In rejecting the claims, the Office asserts that one of skill in the art cannot envision the full genus of molecules of the claimed polypeptide molecules and that the Specification "does not reasonably provide enablement for an osteoclastogenesis inhibitory factor protein limited by name only." *Id.* at page 4.

Applicants respectfully disagree with the Office's rejections under 35 U.S.C. § 112, first paragraph. However, solely in order to facilitate prosecution, Applicants have amended Claims

32 and 35 without prejudice or disclaimer. As such, Applicants respectfully assert that the claim rejections are rendered moot.

Applicants thank the Office for the acknowledgment that the Specification is enabling for "an osteoclastogenesis inhibitory factor protein comprising an amino acid sequence SEQ ID NO:5." *Id.* at page 4. Indeed, the Specification provides numerous polypeptides and compositions comprising OCIF. The Specification also provides for numerous chemical sequences and variants of OCIF. Given this, Applicants respectfully submit that the claimed invention could be practiced by one of ordinary skill in the art with no undue experimentation.

The Office has not met the evidentiary burden to impose an enablement rejection. Moreover, a Specification that discloses how to use a claimed invention "must be taken as in compliance with the enabling requirement of the first paragraph of § 112 unless there is reason to doubt the objective truth of the statements contained therein." *In re Brana*, 51 F.3d 1560, 1566, 34 U.S.P.Q.2d 1436, 1441 (Fed. Cir. 1995), *quoting In re Marzocchi*, 439 F.2d 220, 223, 169 U.S.P.Q. 367, 369 (C.C.P.A. 1971) (emphasis in original). The Office has provided neither evidence supporting the rejection nor any explanation of why the Specification allegedly fails to enable the claimed invention.

As such, it is submitted that Applicants have provided considerable direction and guidance in the instant Specification, and have presented working examples such that it is well within the level of ordinary skill in the art to practice the invention without undue experimentation. The Office has not provided sufficient evidence to cast doubt on the guidance provided in the Specification. Rather, the Office has provided generalizations regarding a lack of predictability in the art and the need for some experimentation.

Even assuming, *arguendo*, that the Office's generalization regarding the unpredictable state of the art is accepted, the conclusion that undue experimentation would be required to practice the claimed method is inconsistent with the current state of the law. Specifically, the law provides that experimentation is not necessarily undue simply because it is complex, if the art typically engages in such experimentation. *See In re Certain Limited-Charge Cell Culture Microcarriers*, 221 U.S.P.Q. 1165, 1174, (Int'l Trade Comm'n 1983) *aff'd. sub nom., Massachusetts Institute of Technology v. A.B. Fortia*, 774 F.2d 1104, 227 U.S.P.Q. 428 (Fed. Cir. 1985).

In rejecting Claims 32 and 35, the Office appears to assert that Claims 32 and 35 encompass variants with unlimited changes to SEQ ID NO:5. Office Action at page 6. Moreover, the Office asserts that one skilled in the art would not have the requisite skill to create an unlimited number of functional variants of SEQ ID NO:5. *Id.* Applicants respectfully assert that this statement is without merit. At the outset, Applicants note that Claims 32 and 35 are drawn to isolated polypeptides consisting of (Claim 32) and comprising (Claim 35) the amino acid sequence of an OCIF protein, wherein said OCIF protein has a molecular weight by SDS-PAGE of 60 kD under reducing conditions and molecular weights of 60 kD and 120 kD under non-reducing conditions. Contrary to the Office's assertion, the claims are not specifically limited to variants of SEQ ID NO:5.

Moreover, there is no requirement to provide **all** of the ways that the claimed invention can be practiced. MPEP § 2164.01(b). The enablement requirement is satisfied as long as the Specification discloses at least one method for making and using the claimed invention that bears a reasonable correlation to the entire scope of the claim. *Johns Hopkins University v. CellPro, Inc.*, 152 F.3d 1342, 1361, 47 USPQ2d 1705, 1719 (Fed. Cir. 1998). Applicants have satisfied this requirement by providing numerous sequences, pharmaceutical compositions comprising OCIF, and polypeptides capable of improving decreased bone mass, inhibiting differentiation of osteoclasts, and inhibiting formation of osteoclasts. Substitute Specification, for example, at page 3, lines 18-25; page 8, line 24 - page 9, line 2; page 10, lines 18-20; page 24, lines 1 - 24; page 38, line 10 - page 42, line 5; Figures 1-6; Examples 3-5, 13, and 15-17; and Tables 5-9, 14. Given this disclosure, one of ordinary skill in the art at the time the invention was made would also recognize which positions of the OCIF protein are amenable to mutations and conservative substitutions. To the extent that any additional experimentation may be required, Applicant notes that the performance of routine and well-known steps cannot create undue experimentation even if it is laborious. *See In re Wands*, 858 F.2d at 737, 8 U.S.P.Q.2d at 1404; *In re Angstadt*, 537 F.2d 498, 504, 190 U.S.P.Q. 214, 218-219 (C.C.P.A. 1976).

Applicants respectfully disagree with the Office's assertion that the amount of direction in the Specification is limited to specific species of SEQ ID NO:5. Office Action at page 6. Applicants also disagree with the Office's assertion that "the specification does not teach how to use variants of SEQ ID NO:5 which are functional." *Id.* Contrary to the Office's position, the

Specification is replete with functional and physical data describing the OCIF protein. Substitute Specification, for example, at page 3, lines 18-25; page 10, lines 18-20; Figures 1-6; Examples 3-5, 13, and 15-17; and Tables 5-9, 14. In addition to purifying and isolating the OCIF protein, Applicants have characterized numerous functional, chemical, and physical properties of the OCIF protein, such as molecular weight, biological activity, thermostability, the *in vivo* effect of OCIF on increasing the mechanical strength of bones in rats, and the use of OCIF in improving decreased bone mass and increasing bone density. *Id.*

Moreover, Applicants have provided numerous OCIF species combined with their shared physical properties. For example, numerous biologically active OCIF variants, including OCIF2, OCIF3, OCIF4, and OCIF5, were obtained from the cDNA library constructed with IMR-90 poly(A) + RNA using the OCIF cDNA fragment as a hybridization probe. Substitute Specification, for example, at page 8, line 24 - page 9, line 2; page 24, lines 1 - 24; page 38, line 10 - page 42, line 5. Additionally, OCIF2, OCIF3, OCIF4, and OCIF5 each have the ability to inhibit octeoclastogenesis. Substitute Specification, for example, at page 9, lines 1-2 and page 42, lines 3-5. Given this, Applicants respectfully submit that the claims satisfy 35 U.S.C. §112, first paragraph, and that one of ordinary skill in the art, given the teachings of the Specification, would have the ability to practice the invention commensurate in scope with the claims.

Applicants have provided considerable direction and guidance, and have presented working examples such that it is within the level of ordinary skill in the art to practice the invention without undue experimentation. In contrast, the Office has not provided specific or sufficient evidence to cast doubt on the guidance provided in the Specification. Rather, the Office has provided generalizations regarding a lack of predictability in the art and the need for some experimentation.

Accordingly, for at least these reasons, it is submitted that the claims are sufficiently enabled under 35 U.S.C. § 112, first paragraph, and withdrawal of this rejection is respectfully requested.

IV. Nonstatutory Double Patenting Rejection

A. Claims 32-35 over Claims 1-2 of U.S. Patent No. 6,855,808

The Office asserts that Claims 32-35 are rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over Claims 1-2 of U.S. Patent No. 6,855,808. Office Action at page 8. In rejecting the claims, the Office asserts that "[t]he polypeptide of claims 1-2 of prior Patent No. 6,855,808 inherently has the functional claim limitation." *Id.* The Office further asserts that "[s]ince the claims are anticipated by one species over the generic claim, both claims are encompassed within the genus." *Id.*

Applicants respectfully submit that the Office has again provided no evidence that Claims 32-35 are obvious in view of Claims 1-2 of U.S. Patent No. 6,855,808. However, solely in order to facilitate prosecution, Applicants are willing to consider submitting a terminal disclaimer in the present case with regard to U.S. Patent No. 6,855,808 upon an indication of allowable subject matter. Additionally, it is noted that the filing of a terminal disclaimer to obviate a rejection based on non-statutory double patenting is not an admission of the propriety of the rejection. *See, e.g., Quad Environmental Technologies Corp. v. Union Sanitary District*, 946 F.2d 870, 20 USPQ2d 1392 (Fed. Cir. 1991) ("filing of a terminal disclaimer simply serves the statutory function of removing the rejection of double patenting, and raises neither a presumption nor estoppel on the merits of the rejection"). In light of the above, Applicants respectfully request that the Office hold in abeyance the nonstatutory double patenting rejections over Claims 1-2 of U.S. 6,855,808.

B. Claims 32-35 over Claims 1-14 of U.S. Patent No. 7,125,686

The Office asserts that Claims 32-35 are rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over Claims 1-14 of U.S. Patent No. 7,125,686. *Id.* In rejecting these claims, the Office asserts that "[t]he polypeptide of claims 1-14 of prior Patent No. 7,125,686 inherently has the same function." *Id.* The Office further asserts that "[s]ince the claims are anticipated by one species over the generic claim, both claims are encompassed within the genus." *Id.*

Applicants respectfully submit that the Office has provided no evidence that Claims 32-35 are obvious in view of Claims 1-14 of U.S. Patent No. 7,125,686. Regarding Claims 33-34, U.S. Patent No. 7,125,686 does not explicitly claim SEQ ID NO:5, and Office has failed to provide any legal or scientific basis of why these claims are obvious in view of Claims 1-14 of

U.S. Patent No. 7,125,686. However, solely in order to facilitate prosecution, Applicants are willing to consider submitting a terminal disclaimer in the present case with regard to U.S. Patent No. 7,125,686 upon an indication of allowable subject matter. Additionally, it is noted that the filing of a terminal disclaimer to obviate a rejection based on non-statutory double patenting is not an admission of the propriety of the rejection. *See, e.g., Quad Environmental Technologies Corp. v. Union Sanitary District*, 946 F.2d 870, 20 USPQ2d 1392 (Fed. Cir. 1991) ("filing of a terminal disclaimer simply serves the statutory function of removing the rejection of double patenting, and raises neither a presumption nor estoppel on the merits of the rejection"). In light of the above, Applicants respectfully request that the Office hold in abeyance the nonstatutory double patenting rejections over Claims 1-14 of U.S. Patent No. 7,125,686.

CONCLUSION

In view of the above, each of the presently pending claims is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejections of the claims, and to pass this application to issue. Moreover, Applicants respectfully request that the Office indicate whether Claims 33 and 34 would be allowable upon the filing of a Terminal Disclaimer. The Examiner is encouraged to contact the undersigned at (202) 942-5186 should any additional information be necessary for allowance.

Respectfully submitted,

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